NAVAL POSTGRADUATE SCHOOL
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HIGH-PERFORMANCE COMPUTING

Recently Dr. Jeff Haferman provided several updates to campus leadership on High Performance Computing. As part of those updates he recapped the short history of HPC, from 2006 when the program was first established with the hiring of Dr. Jeff Haferman. By the next year,12 racks of clusters, 180 nodes, and 706 processors from various vendors comprised the foundation of HPC. On January 30, 2009, NPS celebrated the acquisition of hamming, the Sun 6048 Blade System state-of-the-art supercomputer consisting of 4 cabinets with cooling units, 1152 cores 144 "nodes" and a peak performance of 10.7 teraflops.

Since that time, the Research Board convened an HPC committee which developed a report that highlighted HPC as a core competency at NPS, and noted it as an important recruitment tool for faculty. The subcommittee also addressed the necessity of sustaining HPC at NPS.

From June 20 – July 5, 2011, several upgrades were completed on hamming. The electrical and cooling capacity was doubled from 150 kw to 300 kw; the number of cores and amount of hard disk storage was increased; and the internal network was improved. The "hot aisle" was expanded outward by 6 feet and two Sun racks were removed and repurposed for storage. Four standard racks and two cooling units were added to the remaining two Sun racks.

Purchases for HPC included twelve 48-core of 1U servers — each with 128 GB of Ram and 48 AMD cores, bringing the total "Sun" cores to 768 and AMD cores to 576, and the entire system from 1152 to 1344 cores. An additional 3,136 GPU cores were also purchased. Usable storage grew from 99 TB to 159 TB with a capacity for 480 TB and 950 TB.

The 1 GB Netgear switches were replaced with an enterprise class 10 GB Force 10 switch, and the 36 port Sun DDR switch was replaced with a 216 port QDR Mellanox 40 GB switch, which will improve input/output (I/O) rates and the overall computation speed of the system.

$277.5K of the cost of the upgrade was allocated by the school and rolled into the ITACS HPC budget totaling $555K for equipment, contracts and software. Additionally, ITACS covered $545K in salaries for HPC staff.

The improvements accomplished in June and July provides a quality HPC platform for research and education. The HPC staff will continue to work with faculty and the HPC committee to ensure the system meets the needs of the researchers. The HPC committee has been formally established as a subcommittee of the IT Task Force, which will include HPC as a regular agenda item for its meetings.

ENTERPRISE INFORMATION SYSTEMS

Enterprise Information Systems within ITACS is using JIRA, a web-based tool for software project tracking, to track workflow. Kamil Marcinka has been working with the Office of Academic Planning on a solution for tracking the faculty hiring process. Kamil created a custom-built JIRA workflow process to track the status of a faculty application. The Office of Academic Planning is currently evaluating this new solution.

The JIRA solution is an example of how information technology can be applied in a creative way to act as an enabler of business process

improvement. Workflow configurations similar to the one for the Office of Academic Planning can be used by other departments involved in hiring, e.g., Research and Sponsored Programs Office (RSPO). Kamil has also been working with the Cybersecurity & Privacy team in ITACS on a custom JIRA solution for tracking hardware.

CLASSIFIED COMPUTING

As a result of a $500K grant from Professor of Physics and Classified Computing Committee (CCC) member Dr. Chris Olsen and $260K from ITACS, improvements in the NPS classified spaces such as increasing the JWICS bandwidth, replacing computer systems, upgrading network devices and improving VTC capabilities are underway.

On June 24, 2011, Mr. Joe LoPiccolo and Dr. Christine Haska provided a one-hour Classified Computing Committee (CCC) briefing to Vice President of Finance and Administration Colleen Nickles and Special Assistant to the President Colonel Andrew "Pete" Boerlage. Recapped in the briefing were the recommendations, the results of interviews and a survey of 365 users by the CCC in determining the requirements and objectives of its final report, which stated that classified computing at NPS needs to:

1. Be equal to or better than unclassified capabilities;
2. Have appropriate bandwidth for all networks;
3. Improve its VTC capabilities;
4. Be placed on life cycle maintenance plan;
5. Upgrade its furniture;
6. Improve space conditions;
7. Have appropriate staffing.

ITACS is working on making the space more usable, particularly for those who sponsor workshops and seminars in the facility.

ANNUAL INFORMATION ASSURANCE AWARENESS TRAINING

The new version Information Assurance training is designed to replace the 5-hour online training.

Fifty-six people attended the first training on June 13, 2011. ITACS has received good feedback on the training. Attendees noted that the in-person training saves time and allows people to ask questions. In addition to the improvements to the training, ITACS implemented a new coding system to process attendees' completion of the training. Attendees receive a unique code on a card during the training and later logon to the website and enter the code marking them as having completed the required training.

Monthly IA trainings will be conducted throughout the year. Due to conflicts with afternoon teaching schedules, ITACS will offer the trainings on Fridays, Thursdays at 3:00 p.m. or on Tuesday afternoons when there is no scheduled Secretary of the Navy Guest lecture.

Those using classified networks will still be required to take the computer based DoD training to meet the annual training requirements for those networks.

PARTNERSHIPS AND OUTREACH

Dr. Christine Haska and CIOs from the Naval War College, the United States Naval Academy and NPS conducted their annual meeting from June 21-23, 2011 at NPS. The agenda included visits to NetApp, VMWare and Google in Silicon Valley and on-campus discussions about challenges and

opportunities upon which to develop a common position. During the visit to Google, it was learned that SPAWAR will be the first government agency to use Google's cloud services. A summary of the NHEITC meeting will be distributed to the IT Task Force at their next meeting.

TECHNOLOGY ASSISTANCE CENTER

From July 1 through 28, 2011, the Technology Assistance Center (TAC) received 5,896 requests for assistance, 4,321 of which were resolved by the Tier 1/Tier 2 areas. The remaining 1,575 requests were escalated to groups outside of TAC for specialized assistance. This number represents a 25% increase in requests for assistance from July 2010.

Requests for assistance were categorized as follows:

Phone: 2,958
E-Mail: 2,145
Walk-in: 768
Web: 4
Technician: 21

This month, 93% of all calls were resolved within the Service Level Agreement (SLA). Those that were carried over are awaiting parts, pending information from the customers, etc.